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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/761,240	01/17/2001	Josef-Georg Bauer	GR 98 P 2124 P	5138

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EXAMINER

MONDT, JOHANNES P

ART UNIT	PAPER NUMBER
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3663

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/761,240

Applicant(s)

BAUER ET AL.

Examiner

Johannes P. Mondt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5, 7 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5, 7 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/24/06 has been entered.

Response to Amendment

Amendment filed 9/25/06 has been entered following said RCE. In said Amendment applicant substantially amended claims 5, 7 and 8 through substantial amendment of independent claim 5. Comments on Remarks are included below under "Response to Arguments".

Priority

Referring to the office action and the request therein made under the Heading "Priority", acknowledgment is made of applicant's claim for foreign priority based on an application filed in Germany on 7/17/1998. It is noted, however, that applicant has not filed a certified copy of the German application as required by 35 U.S.C. 119(b). Furthermore, with reference to MPEP 1895.01 [-R5], there is no evidence that the application has been co-pending with the international application of which it is filed as a continuation under 35 U.S.C. 120 (which applies to the application; see Combined Declaration and Power of Attorney filed 3/2/01). In particular, with regard to the

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conditions required for co-pendency, with reference to the following explanation in MPEP 1895.01[-R5],

a U.S. national application is considered copending with a prior international application designating the U.S. if the international application was pending on the filing date of the U.S. national application. Generally, except in cases where the international application has been withdrawn (either generally or as to the United States),

an international application becomes abandoned as to the United States upon expiration of 30 months from the priority date (i.e., the priority date claimed in the international application or, if no priority is claimed, the international filing date) unless a proper submission under 35 U.S.C. 371 to enter the U.S. national phase is filed prior to the expiration of this 30-month period. See MPEP § 1893.01(a)(1) and § 1893.02.

However, if the international application is one where the 20-month period from the priority date expired before April 1, 2002, then it was necessary to file a demand electing the United States prior to the expiration of 19 months from the priority date in order to extend the international phase to 30 months from the priority date. If such a demand was not timely filed, then under former 37 CFR 1.494, such an international application became abandoned at the expiration of 20 months from the priority date unless a proper submission under 35 U.S.C. 371 to enter the U.S. national phase was made prior to the expiration of 20 months from the priority date

Noting that the 20-month period from the priority date (7/17/98) expired on 3/17/00, i.e., expired before 4/1/02, in order to extend the international phase to 30 months a demand should have been filed electing the United States prior to expiration of 19 months from said priority date of 7/17/98, i.e., prior to expiration date 2/17/00. Examiner see no evidence of said demand having been filed and accordingly requires such evidence to be provided in order for co-pendency of the application with the international application to be verified. Short of this evidence examiner cannot recognize

the continuing data nor the priority, and, depending on publication date, may actually qualify as prior art under 35 USC 102(b).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. ***Claims 1, 7 and 8*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Schulze (5,610,415) in view of Rosling et al (IEEE Transactions on Power Electronics, Vol. 9, No. 5, September 1994, pages 514-521).

Schulze teaches a power semiconductor element, namely a GTO thyristor (title, abstract and col. 1, l. 5-32) comprising:

an emitter region 4 (either n-doped or p-doped; see col. 1, l. 47-col. 2, l. 37); and a stop zone 9 (col. 2, l. 3-43) in front of said emitter region (namely in region 9; see Figure),

said stop zone having foreign atoms, and, in the case of n-doped emitter 4 having foreign atoms of p-type conductivity, such as for instance gold (Au), cadmium (Cd), zinc (Zn), or nickel (Ni); in the case of p-doped emitter 4 having foreign atoms of n-type conductivity such as barium (Ba), molybdenum (Mo), niobium (Nb), or cesium

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(Cs) (see col. 2, l. 11-20). Hence, said emitter region and said stop zone have mutually opposite conductivities, namely n- type and p-type, or p-type and n-type, respectively. *Schulze does not explicitly teach* the limitation that said foreign atoms have at least one energy level within the band gap of the semiconductor and at least 200 meV away from both valence and conduction band of said semiconductor, being silent on the material embodiment of the semiconductor in explicit terms. However, it would have been obvious to select silicon for said semiconductor, because thyristors are in their most common embodiment made of a silicon semiconductor layer, as witnessed for instance by Rosling et al: e.g., see Abstract, second paragraph, and "I. Introduction", page 514, second column, second paragraph). *Motivation* to select silicon for the semiconductor embodiment derives at least from the well-tested and cheaply manufactured device thus configured. Furthermore, Applicant is reminded that it has been held that mere selection of known materials generally understood to be suitable to make a device, the selection of the particular material being on the basis of suitability for the intended use, would be entirely obvious. In re Leshin 125 USPQ 416. *Combination of the teaching by Rosling et al with the invention by Schulze immediately satisfies said limitation* because gold (as acceptor (A): 290 meV), barium (as donor (D): 320 meV), cesium (as donor (D): 300 meV), molybdenum (300 meV), nickel (as acceptor (A) 350 meV) have at least one energy level within the band gap of silicon and 200 meV away from both the conduction band and valence band of silicon, as witnessed by the collected and evaluated data in Sze as made of record 5/15/02, page 21, Figure 13.

On claims 7-8: from applicant's specification the desirability of both selenium and sulfur as foreign atoms is explained solely on the basis of the adequate minimum distance of 200 meV of the energy levels of selenium and sulfur as donors from the band gap of silicon. Selenium and sulfur share this property with the donors cesium, molybdenum, and barium taught by this prior art in the form of Schulze. *Therefore, the materials selected by the prior art are understood to be suitable to make the device.* Applicant is reminded in this regard that it has been held that mere selection of known materials generally understood to be suitable to make a device, the selection of the particular material being on the basis of suitability for the intended use, would be entirely obvious. In re Leshin 125 USPQ 416.

Response to Arguments

Applicant's arguments with respect to claims 5, 7 and 8 have been considered but are moot in view of the new grounds of rejection as provided above, necessitated by substantial amendment.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JPM

November 10, 2006

Patent Examiner:

A handwritten signature in black ink, appearing to read 'J. Mondt', is written over the printed name.

Johannes Mondt (Art Unit: 3663)